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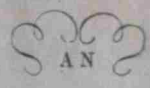
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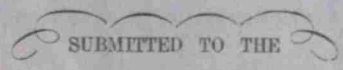


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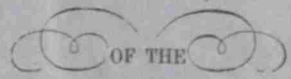
ON

The Coluber, or Rattlesnake,



SUBMITTED TO THE

PRESIDENT, BOARD OF TRUSTEES, AND MEDICAL FACULTY



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DOCTOR OF MEDICINE.

BY

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OF

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LEWIS

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COLL.

Very Good by orography body

Crotalus (From κροταλον. a rattle) The rattlesnake. A genus of venomous serpents abounding in various parts of the American continent. There are three species, the characters of which are well ascertained, *C. durissus*, *C. horridus*, and *C. miliaris*, a fourth *C. casabella*, has been recently found in Brazil. The serpent tribe are distinguished from all other animals by a peculiar character, in which their figure, motion, and habits, so repulsive and disgusting, form a striking contrast to the beautiful and variegated colours with which their skin is studded, adding, if possible, to their subtle and venomous appearance; while their crawling motion strikingly exemplifies the decree of the creator, made after the temptation and fall of man - "Because thou hast done this, cursed art thou above all the cattle, and every bird of the field, upon thy belly shalt thou go, and dust thou shalt eat all the days of thy life." If we take a survey

of serpents in general they have marks by which they are distinguished from all the rest of animated nature, they have the length and suppleness of the eel, but want fins to swim with; they have the scaly covering and pointed tail of the lizard, but they want legs to walk with; they have the crawling motion of the worm but unlike that animal they have lungs to breathe with; like all the reptile kind they are resentful when offended, and nature has supplied them with terrible arms to revenge every injury.

Though they are possessed of every ^{different} degree of malignity, yet they are all formidable to man, and have a strong similitude of form to each other, with respect to their conformation all serpents have a very wide mouth in proportion to the size of the head; and, what is very extraordinary, they can gap and swallow the head of another animal which is three times as large as their own. I have observed this fact of deglutition, several times in the coluber

or rattlesnake; when swallowing medium sized house rats, with great facility, after having killed and skinned them, the snake in question had twelve corns and a button, thus we may infer it was 14 years old considering it was one or two years old before it had any, those rats were several times larger than the snake's head. however, it is not surprising that the skin of the snake should stretch to receive so large a morsel; the wonder seems how the jaws could take it in. To explain this it must be observed, that the jaws of this animal does not open as ours, in the manner of a pair of hinges, where bones are applied to bones, and play one upon another: surely bones are applied to bones, but in a very different manner to what we generally see.

On examining the articulations of the inferior & superior maxilla, of the rattlesnake; I understand how it is they admit so large a body in deglutition, the inferior and superior maxilla are articulated with the bone that joins with the posterior

portion of the cranium, it is near $\frac{1}{2}$ an inch in length running backwards and outward, this peculiarity of the three bones joining laterally, gives the broad and bulging appearance to the back part or posterior portion of the head, we thus infer from this provision of nature, how ~~the~~ it is the snake can open its mouth so wide, and admit bodies much larger than its own head. While the action or process of deglutition is going on you notice the salivary glands are very much excited, without which it would be impossible for the snake to swallow an animal so large as a squerrill, rat &c. but the saliva flows in such quantity you may see it on the lips and in the ~~corners~~ ^{angles} ~~regions~~ of the mouth, the snake I was observing is what is called the Diamond rattlesnake, this species are very numerous in Roberson County Tennessee they are a very quiet snake when unmolested, I have herd persons say, they have in their hunts come suddenly upon this species, and they would lay

perfectly still untill you might step over them, without being molested in the least, but as soon as you strike or touch them, they either strike in turn, or make ready for battle. I had three of this Species, (Diamond rattlesnake), and in my experiments on them, Caging particularly; I was not as cautious as I should have been, on making a cage I would say to any one making or having made, a cage for those animals, should not let the openings or interstices between the wire exceed $\frac{1}{4}$ of an inch square, glass may be put on the inside of the wire if you choose, but in my case I only had a wire front; the interstices being near $\frac{1}{2}$ an inch square, the smallest one crept out between the wires in the ware house, and during the time it was out, it caught and swallowed a common size rat. Fortunately there was a little dog left in the ware house that night, the dog herd the snake rattling, and commenced barking, this disturbed my rest, I got up to put the dog out, and discovered that the snake had escaped, you can imagine

how I felt better than I can describe. However, I in company with my cousin proceeded to hunt its whereabouts, soon found it and by the weight of a large staff held it firmly, untill it was killed by my cousin, you may risk assured it takes no easy blow to render one of those animals powerless, notwithstanding you may have seen in print where the naturalist speaks of the shallow cranium, and a light blow on the head killing them. Those three snakes lived apparently happy together, but the largest one did contrall the others, particularly when I would put a rat into the cage; all ware verry calm, but on being aroused with a rod they grew angry, the largest one in particular, it would coil upon itself in readiness to strike; at the same time rattling furiously. the rats generally appeared verry uneasy running round to find a way out. in one instance the rat reared up on the wire, showing fear even to trembling, in each case the largest one would end the se-

one by giving it a blow; which in a space of time from two to eight minutes would suffice to kill, in one case after throwing a rat in at the small trap door above, I immediately opened the large door that hung before the wire front and saw the rat dead enough, in this case he must have pierced his most vital parts, strang to say they drank no water during the time I had them, they would move round from it as though it was repugnant to their feelings, the oldest and largest one lived about 7 months, and during this time eat three or four rats only, the one next to the oldest lived near five months without eating or drinking. This snake would not eat any animal, excepting it was killed by himself; I tried them with small bits of beef &c, but they would not eat any of those substances, in one instance I gave them a small chick, and after exciting the largest one he struck it on the back, the blood jetting out once or twice; it was longer dying than any of the rats, the snake approached it, touching it with his tongue occ

-asionally that he might know when it was dead, in a few minutes he expanded his jaws and taking a firm hold of it, but no sooner had he got it partly in his mouth than he all at once threw it out apparently frightened, as much as to say you dont suit my taste.

Antipathy of the rattlesnake to whiteash leaves.

The accounts given by Judge Woodruff mention that he was one of a small party who went to the Mahoning river for the purpose of hunting deer. The party took their station on an elevated spot fifteen or twenty yard from the waters edge. Here the men watched for their wished for game about one hour, but instead of a harmless and beautiful deer, they saw a large rattlesnake which had crawled out from among the rock beneath them, and was slowly making his way across a narrow smooth sand beach towards the river. Upon hearing the voice of the men, the snake halted and lay stretched out with his head near the water. It was now determined to try the whiteash leaves. Accordingly

search was made, and a small whiteash sappling, eight or ten feet long, was procured, and with a view to make the experiment more satisfactory, another sappling of sugar maple was cut. In order to prevent the snakes retreat to his den, the Judge approached him in the rear, and when he had approached within almost eight feet of him, the ^{advanced} snake coiled up his body, elevated his head several inches, brandishing his tongue, and thus signified his readiness for battle. The Judge then presented his whiteash wand, placing the leaves upon the body of the snake. The snake instantly dropped his head upon the ground, unfolded his coil, rolled over on his back, twitched and twisted his whole body in every form but that of a coil, and gave signs of being in great agony. The whiteash was then laid by, upon which the snake immediately placed himself in a coil, and assumed the attitude of defence as before. The sugar

maple stick was next used. The snake darted forward in a twinkling, thrust his head into the leaves "with all the malice of the under fiends;" and the next moment coiled and lanced again, darting his whole length with the swiftness of an arrow: "after repeating this several times," says the judge. "I changed his fare, and presented him with the whiteash. He immediately doused his beak, stretched himself on his back, and writhed his body in the same manner as on the first application. All are covered with scales, or scaly tubercles, their brain case or cranium is weak and shallow, the formation and conjunction of the vertebra are well adapted for mobility, being that of a ball and cup articulation, these vertebra vary in number, in serpents differing in age.

All parts of their body have great force, agility, and elasticity. They are most abundant in warm and temperate regions; but increase in size and numbers, in proportion to the heat and moisture, and to

the freedom of their range. They have less blood than quadrupeds, a lower animal heat, and less interior activity of system. They are most animated in times of tempests and hurricanes, when the electricity of the atmosphere is in the greatest perturbation. Their sense of hearing is dull, but their vision is acute. Their sense of taste is probably of considerable delicacy, as the tongue is very slender, and divided into two joints or a bifid extremity, which admits of its being readily applied to sapid bodies. Their sense of touch is probably obscure. They give many indications of high instinct and sensibility, and have the faculty of existing a long period without food. They have no voice, but a hiss, which uttered softer or stronger according to the exciting cause. It is exerted exclusively in the declaration of their fiercer passions. In the snake under consideration, the most distinguishing characteristic, is the rattle appended to its

subcaudal extremity. These are considered to be a production of the skin, traversed by a soft cancellated bone, from microscopical examinations of Prof. C. B. Haskins of Clarksville Tennessee. These cornets are moveable on one another, and when excited he considerable motion to this part, causing a rattling or singing sound, thus giving a signal of danger to whatever it might be that caused an excitement. In this we see the wisdom and goodness of our creator, on supplying the serpent with so venomous a poison; and at the same time making so great a provision for the higher order of animated nature, yea even man the master of all, by giving it an apparatus so well adapted to its nature, that it might warn an enemy or intruder in due time. The number of these cornets or rattles increase with the age of the serpent, one being added on each ann-

the cornea cannot be seen on the film with the naked eye, but when seen in the snake it is a ashey grey colour, the vertical diameter being twice or thrice that of the horizontal, it has been said they have a nictitating membrane to protect the eye, similar to that of a birds, but this I have not seen in my examinations; nor do I believe they ever shut their eyes, if they did I never saw them. The detachment is beautiful in itself, and at the same time presenting the snake in its most beautiful colours, these are of an orange, tawny, and velvety colour on the back, and of an ash colour on the belly. The male may be readily distinguished from the female, by a black velvet spot on the head, and by the head being smaller and longer. I now give the microscopical examinations of the film or transparent membrane, by Prof. C. P. Haskins, of Clarksville Tennessee.

The surface cannot be seen in the film with the microscope, but when seen in the water it is a shagreened surface. The vertical diameter being twice or three times of the horizontal, it has been said that they are conical being numerous to protect the eye, similar to that of a bird's, but this I have not seen in any specimen. One of a species they saw that this year of they are a common form. The attachment is thin, typical in itself, and at the same time presenting the back in its most beautiful colors. This one of an orange, tawny, and white color in the back and of an ash color on the belly. The web may be very distinguished from the female, by a black dot that is on the back, and by the head being less than deeper. I have given the microscopic examination of the film is transparent and has

Fig 3



Fig 2



Fig. 1.



Figure one is a highly magnified portion of the covering of the eye - a. is that portion covering the outer border of the cornea, and b. that covering the conjunctival portion - C the transition from the conjunctival to the corneal portion, the hexangular cells b. measure $\frac{1}{660}$ of an inch, those of a the $\frac{1}{800}$ of an inch. Fig 2 exhibits the central portion of the corneal membrane - cells here measure $\frac{1}{1000}$ part of an inch, you will thus see that the membrane is continuous having the same elements. that the cells rather abruptly become spread out as they reach the cornea, and then gradually move to the central portion of the cornea - 1st $\frac{1}{660}$, then $\frac{1}{800}$ and lastly $\frac{1}{1000}$ of an inch. Figure 3. Represents the pigment cells as found in the colouring matter of the skin of the head - highly magnified - their hexangular form not so perfect. Serpents which are venomous par-excellence, have their organs of manducation construe-

-propriate muscles, raise it for inflicting the bite,
before and after they lie folded back in the mo-
-uth, surrounded by a dense cellular sack, behi-
-nd them are several germs destined to replace
them, in the event of either of them being bro-
-ken off in a wound, these venomous teeth have
been termed by naturalists moveable fangs,
but in fact it is the maxillary bone which mo-
-ves; there are no other teeth in it, so that in-
-his kind of dangerous serpents only, the two ro-
-ws of palatine teeth are to be seen in the
roof of the mouth, these teeth are twelve in
number, six being in each row, and with
those in the inferior maxilla six or seven
on each side, are called teeth of retention,
they are curved from before backward, thus
being well adapted for retaining its prey on
being grasped. The poison is secreted in two con-

-glomerate glands, which lie on each side of the head and is carried by ducts to the roots of the fangs, where it is discharge into the poison bag. This consists of muscular fibres, both longitudinal and circular, by which it contracts when the fangs are erected, and by this contraction the poison is pushed into the canal at the roots of the fangs, and forced out at the aperture near the point. The poison itself is an acid with many saline ingredients, which rapidly chrystalize on exposure to the atmosphere. it exists only in small quantities, but a verry small drop is sufficient to produce death.

All these venomous Species, whose mode of production is well known, bring forth the living young ones, as their eggs are hatched without being laid, from which circumstance is derived their common name of vipers, a contraction of viviparous. When a reader, ignorant of anatomy, is told, that some of those animals, produce

their young alive, and that some produce eggs only, he is apt to suppose a very great difference in their internal conformation, which makes such a variety in ~~the~~ manner of bringing forth. But this is not the case: these animals are internally alike, in whatever manner they produce their young, and the variety of their bringing forth is rather a slight than a real discrimination. The only difference is, that the viper hatches her eggs, and brings them to maturity, within her body, the snake more premature in her productions, and sends her eggs into the light sometime before the young ones are capable of leaving the shell. Thus if either are opened, the eggs will be found in the womb, covered with their membranous shell, and adhering to each other like large beads on a string. No subject has caused more philosophical controversy than the poison of serpents, with regard to its nature

and mode of operating, towards the end of the last century, this subject was greatly illustrated under the auspices of Ferdinand 2^d Great Duke of Tuscany: This prince, desirous of enquiring into that mysterious question, the nature of serpents, invited Steno, Rhedi, and some other philosophers of the first eminence, to his court; and a multitude of the most poisonous serpents being collected, Rhedi, made several experiments upon them, which discovered to him a number of particulars before unknown; of which the following seem to have the best claim to our attention, when he either caused a living viper to bite a dog, or wounded him with teeth of one newly dead (the poison vesicle remaining unbroken), the event was the same. If the bite was repeated, its effects became weaker, and at last was lost, the poison contained in the vesicle being totally ex-

-austed. That the teeth of serpents, when extended to bite, were moistened over with a certain liquor; and when the vesicle at the base was pressed, a drop of poison flowed to the point of the fang, when the poison thus flowing from the vesicle was received into a soft bread or sponge, an animal bitten by the serpent received no more harm from the wound than from being pricked by a needle, till after a few days, when the venom was restored afresh: but when an animal was wounded with the point of a needle dipped in the poison, it was tormented with the same pains as if it had been bitten by the viper itself, preserving some of this poison in a glass, and totally evaporating the moisture in the sun, when the residuum was diluted again with water, and the point of a needle dipped in the solution, Rhedi found to his great surprize that it had the same effect as when rece-

-nt. But the boldness of Loggi, one who charmed wife-
-ers, flung all those men who were deeply vers-
-ed in natural philosophy into the utmost as-
-tonishment. They happening to fall into discourse (while
the prince was present), upon the certain death
that would attend any person swallowing this
poison by mistake, instead of spirits of wine or wa-
-ter, Loggi confiding in his art, drank a consi-
-derable portion of it without hesitating: They
were all astonished at his apparent rashness, and
predicted instant death to the man; however, he
escaped as safely as if he had drunk only so
much water. This event, which struck the prince
and his illustrious associates in these philosophical
enquiries by its novelty, was well known to the
ancients. Ducas, in the 9th book of Pharfalia, speak-
ing of the serpent, says,

*Non serpentum est admisso sanguine pestis
Morsu virus habent et fatum dente minatur.*

bottom Procula morte carent.

Mixed with the blood this venom flies along.
His bite is poison; death is in his fang.

Yet is the drought innocuous.

The bites of all venomous serpents are cured by the same local; which are verrey simple, if they were always at hand. The injured part must be instantly destroyed or cut out, destroying it is the most safe, and equally certain; and the best application for that purpose is the *Lapis infernalis* or Caustic potash, these are preferable to a hot iron, which the ancients used, because a hot iron forms an eschar, which acts as a defence to the under parts, instead of destroying them. The *Lapis infernalis* is much better than any other caustic, as it dissolves and penetrates during its application. The bitten part must be destroyed to the bottom, and where there is any doubt that the

bottom of the wound is not sufficiently exposed, caustic Potash should be introduced into it on the day following, as deep as possible, and incisions should be made to lay ~~every~~ every part open to the action of these applications. Besides destroying, burning, or cutting out the part, incisions should be made to lay every part open to the action of the round the wound, to prevent the communication of the virus. The wound is to be dressed for some time with poultices, to assuage the inflammation caused by the caustics; and afterwards with acrid dressings and hot digestives to drain the injured parts. Ligatures applied instantly above the bitten part, if it be so placed as to admit one, was found by some experiments a good preventative against the diffusion of the poison, its compression should be considerable, but not excessive.

The Southern Medical Journal contains the

description of a case by Doctor. T. A. Atchison, in which a girl seventeen years of age, bitten on the left instep by a rattlesnake, was cured by being placed in a hot bath, whiskey, and carbonate of Ammonia administered to her, untill she had taken three pints of the former, and eighty grains of the latter. It was two hours and a half after the bite that Doctr. A. visited his patient, when he found her sightless, her face swollen, and her mind wandering. The liquor caused no intoxication, and the cure was complete.

The snake may reach the eminence as certainly as the eagle, but he reaches it by crawling, and he still remains a snake.